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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/089,479 | 03/28/2002 | Bong-Cheol Kim | A35109 PCT USA | 1153 |

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BAKER & BOTTS
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

[REDACTED] EXAMINER

NHU, DAVID

[REDACTED] ART UNIT [REDACTED] PAPER NUMBER

2818

DATE MAILED: 05/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------|-----------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/089,479 | KIM, BONG-CHEOL |
| | Examiner | Art Unit |
| | David Nhu | 2818 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 13 May 2003.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) 1-16 is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 17,19,20,22 and 24 is/are rejected.

7) Claim(s) 18,21 and 23 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 28 March 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. PCT/KR00/00935.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). _____ .
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) Other: 

DETAILED ACTIONS

Election/Restrictions

1. *Applicant's election of Group I (Claims 17-24) in page No.7 is acknowledge.*

Claims 17-24 are present for examination. Accordingly, claims 13-16 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Drawings

2. Figure 1 should be designated by a legend such as—**Prior Art**—because only that which is old is illustrated. See MPEO & 608.02(g).

There is no description of 14, 15, 50 of figures 3, 4C in specifications.

Specifications

3. What is “atm” in pages 1, 2 of the specifications?

Claim Objection

4. Claim 22 is not clear because the claim 9 is cancelled.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 17, 19-20, 21, 24 are rejected under U.S.C 103(a) as being unpatentable over Itoh et al (6,218,207 B1) in view of Kelly et al, 2/1/99, "Large Free-Standing GaN Substrates by

Hydride Vapor Phase Epitaxy and Laser-Induced Liftoff", and Wong et al, 10/30/97, "Damage-free separation of GaN thin film from sapphire substrates".

Regarding claim 17, Itoh, figures 1-14, and related text on col. 1-18, (figures 7, 8A-8C) discloses a method of forming a nitrogen compound semiconductor substrate, the method comprising the steps of: preparing a parent substrate 22; forming a single crystalline nitride film 25 on the parent substrate in a reacting chamber.

Itoh fails to teach moving the parent substrate onto a heating chamber and maintaining the single crystalline nitride film in a predetermined temperature which is higher than a room temperature; and illuminating laser beam on a backside of the parent substrate and separating the single crystalline nitride film from the parent substrate.

However, Kelly, figures 1, 2, pages 1-2, teach moving the parent substrate onto a heating chamber and maintaining the single crystalline nitride film in a predetermined temperature which is higher than a room temperature; and illuminating laser beam on a backside of the parent substrate and separating the single crystalline nitride film from the parent substrate.

Also, Wong, figure 1, pages 1-2, teach moving the parent substrate onto a heating chamber and maintaining the single crystalline nitride film in a predetermined temperature which is higher than a room temperature; and illuminating laser beam on a backside of the parent substrate and separating the single crystalline nitride film from the parent substrate.

Regarding claims 19-20, 22, 24, Itoh, col. 1-16, Kelly, Wong, pages 1-2, teach the substrate is selected from one of sapphire, spinel or silicon carbide; wherein the single crystalline nitride layer is formed by a hydride vapor phase epitaxy.

It would have been obvious to one having ordinary skill in the art at the time of the present invention to apply the teachings of Kelly, Wong into the method of Itoh as they are related to the same subject matter of forming a single crystalline nitride layer on a substrate in a heating chamber *with a temperature which is higher than a room temperature*.

Allowable Subject Matter

7. Claims 18, 21, 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Itoh, Kelly, and Wong are taken individually or in combination, and do not teach moving onto a supporter the parent substrate on which the single crystalline nitride film is formed, wherein the supporter is positioned in a heating chamber which is connected to the reacting chamber within a processing channel (as cited in claim 18); positioning a material selected from group III at a first temperature range of 600 °C to 900 °C in the reacting chamber and positing the parent substrate at a second temperature range of 1000 °C to 1100 °C in the reacting chamber (as cited in claim 21); wherein the apparatus further comprises an exhausting chamber positioned between the reacting chamber and the heating chamber, and wherein each of the reacting, exhausting and heating chambers is isolated from each other by shutters.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Zhang'839 is cited as of interest.

9. A shortened statutory period for response to this action is set to expired 3 (three) months and 0 (zero) day from the date of this letter. Failure to respond within the period for response

will cause the application to become abandoned (see 710.02 (b)).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Nhu, (703) 306-5796. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. The examiner's supervisor, David Nelms can be reached on (703) 308-4910.

The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956

David Nhu *SN*



May 26, 2003